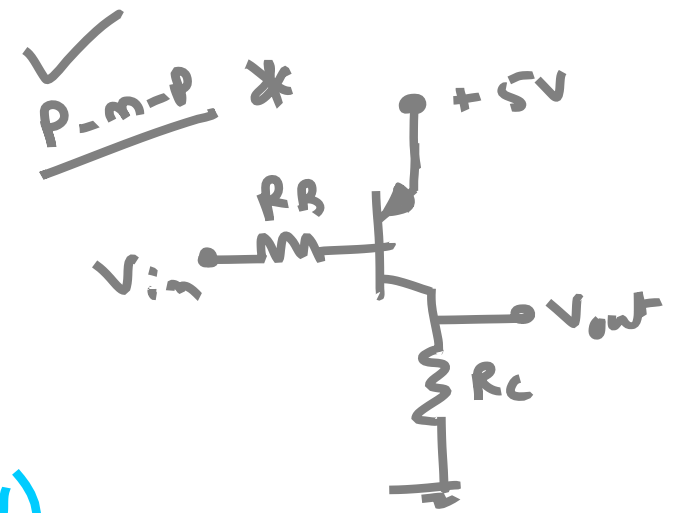
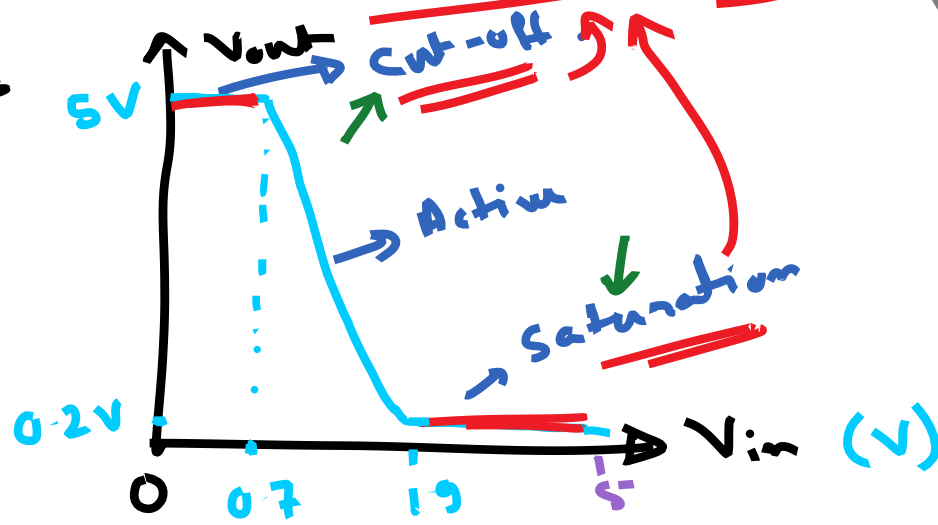


BJT as Switch



BJT as Switch:

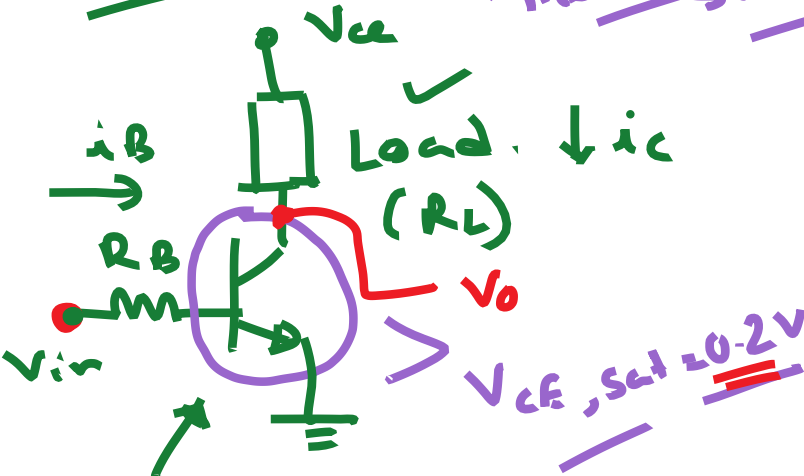
Mechanical Switch.

✓ $V_{in} = 0V$, Cut-off, $i_B = 0$, $i_C = 0$, $V_o = V_{cc}$

✓ $V_{in} = V_{cc}$, Saturation, i_B finite, i_C finite,

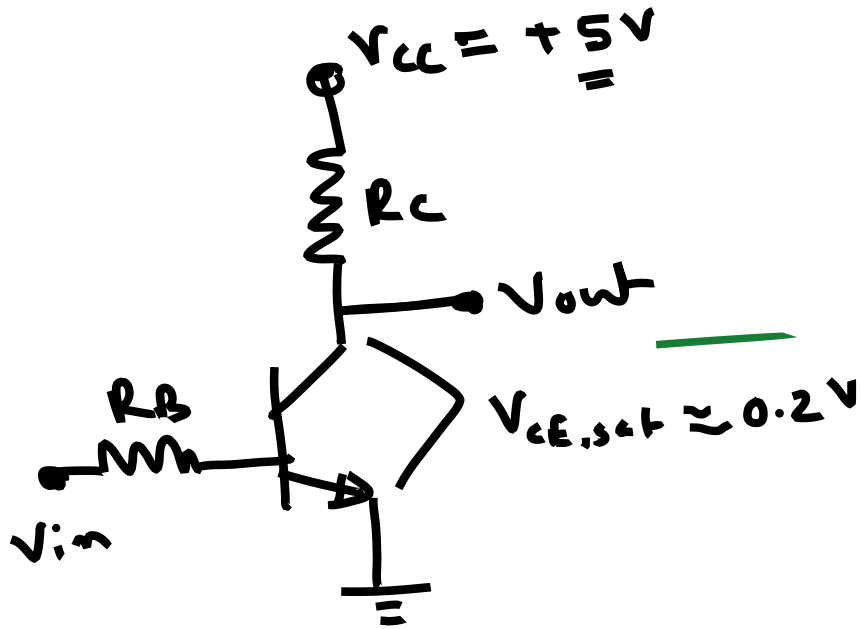
$$V_o = V_{cc} - i_C R_L \approx 0.2V$$

voltage drop across Load = $(V_{cc} - 0.2)V$.



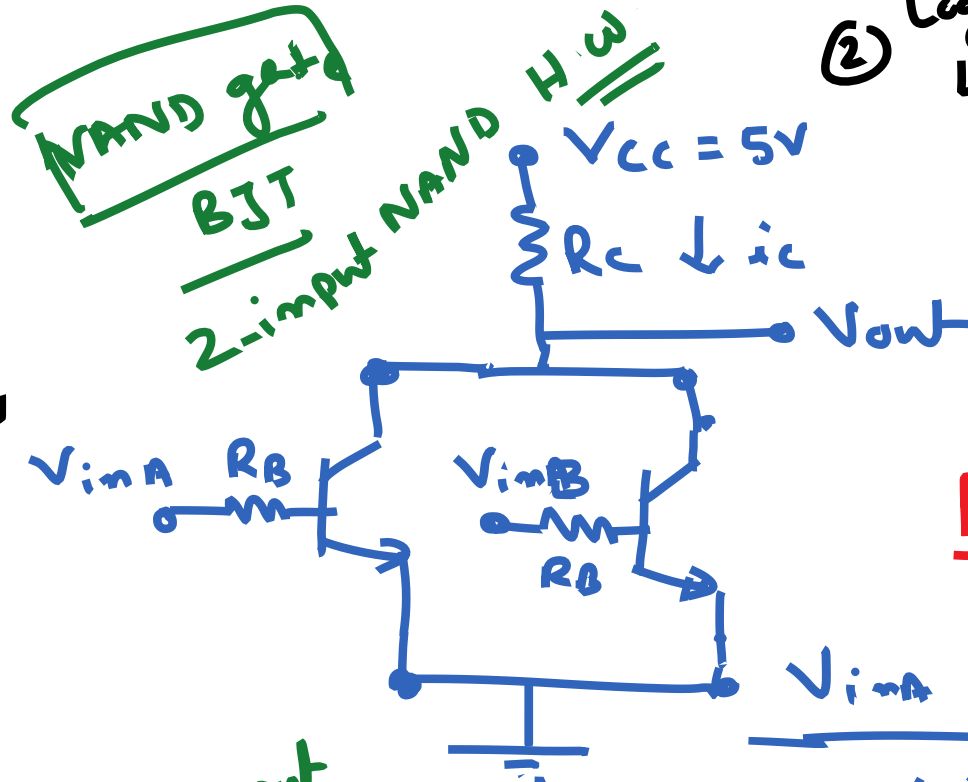
BJT as Logic Gates

- ① Logic \rightarrow '1'
High \rightarrow High voltage ($\sim 5V$)
- ② Logic \rightarrow Low voltage ($0V$)
Low \rightarrow '0'



Inverter circuit

V_{in}	V_{out}
✓ Low (0)	High ($\sim 5V$)
High ($\sim 5V$)	Low ($\sim 0.2V$)



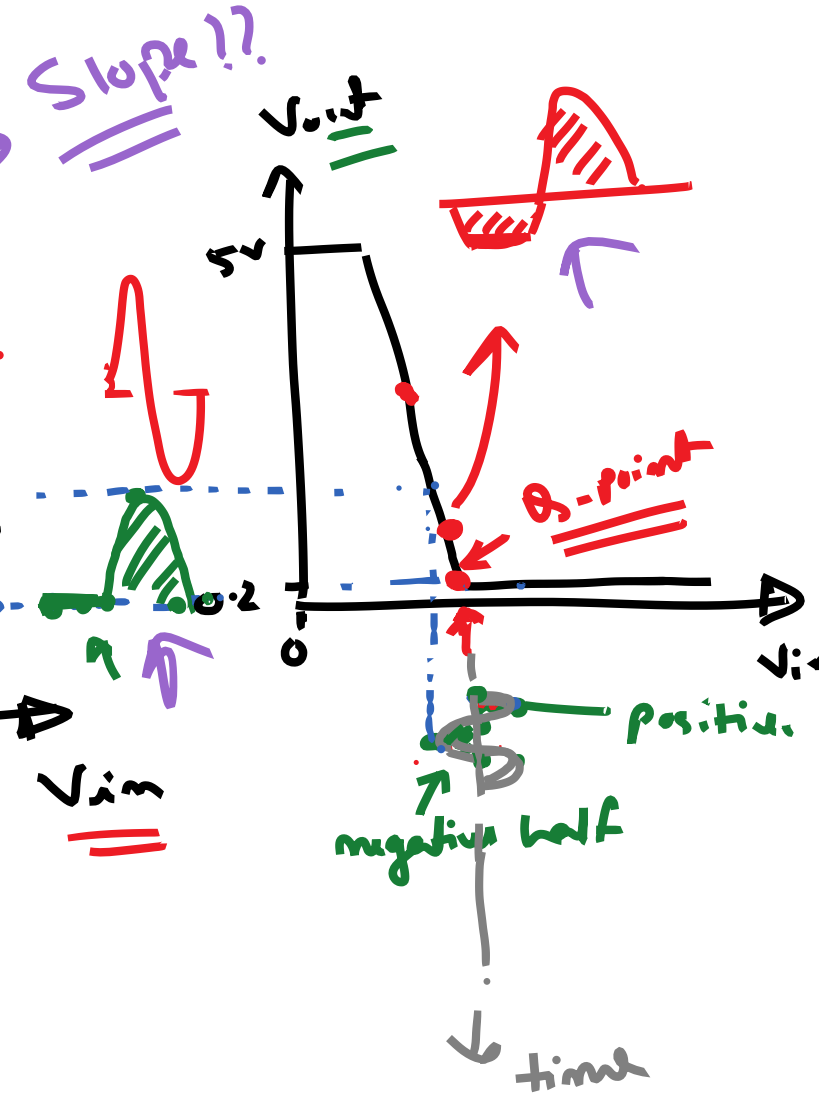
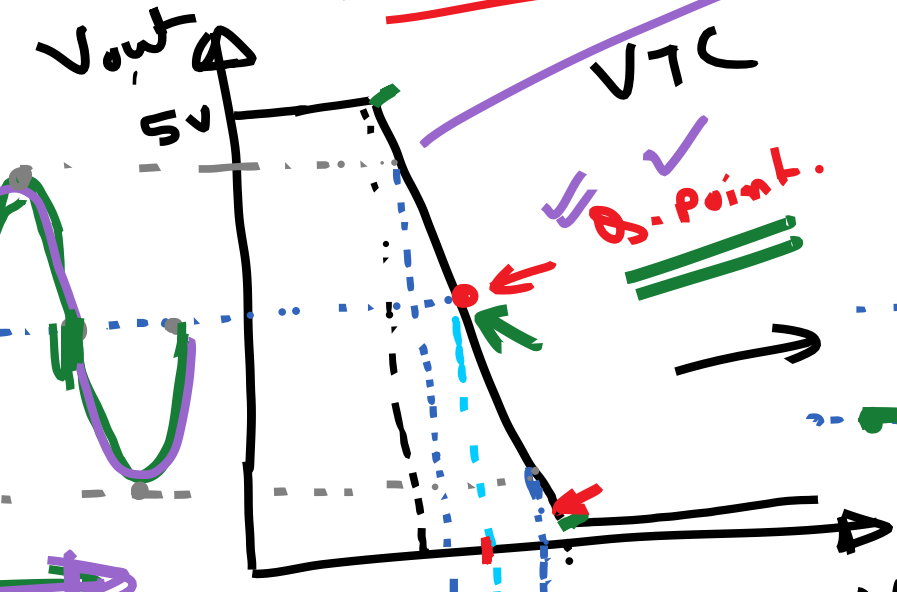
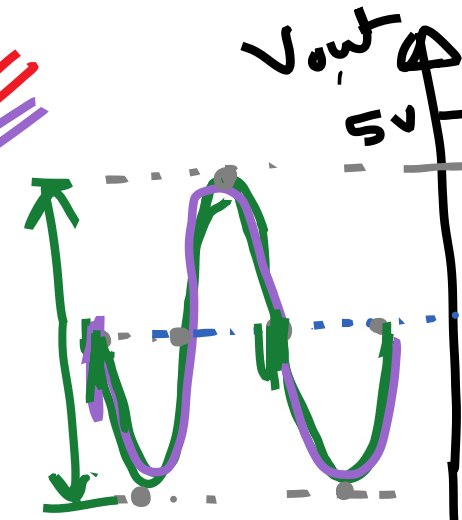
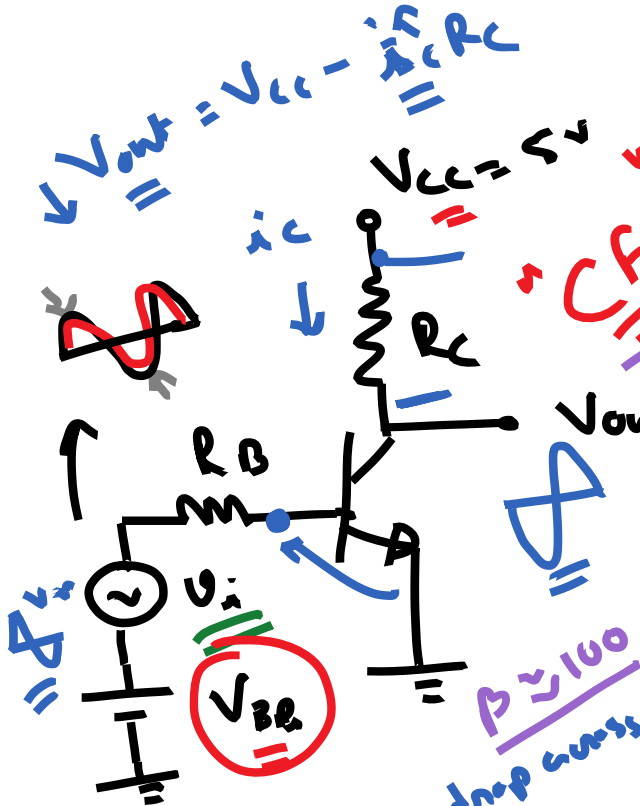
2-input
AND gate

H.W.

NOR \rightarrow gate

V_{inA}	V_{inB}	V_{out}
Low (0)	Low (0)	High (1) ✓
Low (0)	1 High	Low (0)
1	0	Low (0)
1	1	Low (0)

BJT as Amplifier ✓



V_{in} , i_B , i_C , V_{out}
 R_C
 180°
 $out\ of\ phase$

β
 50
 100
 120

$min. slope_{reqd} > 1$